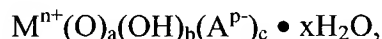


**WHAT IS CLAIMED IS:**

1. A cationic shelled particle comprising a colloidal alumina core having a median diameter of between 20 and 2000 nm and a positive charge, a layer on the surface of said core particle having a negative charge and comprising particles of a median diameter of less than 30% of the diameter of said core particle, and an outer layer of positive charge.
2. The cationic particle of Claim 1 wherein said colloidal alumina core has a zeta potential of between +20 and +70 mV at a pH of between 2 and 6.
3. The cationic particle of Claim 1 wherein said core comprises alumina or boehmite.
4. The cationic particle of Claim 1 wherein said core comprises hydrous alumina.
5. The cationic particle of Claim 1 wherein said core has a median diameter of between 50 and 500 nm.
6. The cationic particle of Claim 1 wherein said layer on the surface of said core comprises particles of silica.
7. The cationic particle of Claim 1 wherein said layer on the surface of said core comprises particles having a median diameter of between 2 and 50 nm.
8. The cationic particle of Claim 1 wherein said layer on the surface of said core comprises particles between 0.1% and 20% of the median diameter of said core.

9. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises a metal oxide hydroxide complex.

10. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises a metal oxide hydroxide complex of



wherein

M is at least one metal ion;

n is 3 or 4;

A is an organic or inorganic ion;

p is 1, 2 or 3; and

x is equal to or greater than 0;

with the proviso that when n is 3, then a, b and c each comprise a rational number as follows:  $0 \leq a < 1.5$ ;  $0 < b < 3$ ; and  $0 \leq pc < 3$ , so that the charge of the  $M^{3+}$  metal ion is balanced;

and when n is 4, then a, b and c each comprise a rational number as follows:  $0 \leq a < 2$ ;  $0 < b < 4$ ; and  $0 \leq pc < 4$ , so that the charge of the  $M^{4+}$  metal ion is balanced.

11. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises a organosilane or hydrolyzed organosilane.

12. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises a organosilane or hydrolyzed organosilane having the formula:



wherein

R is hydrogen, or a substituted or unsubstituted alkyl group having from 1 to about 20 carbon atoms or a substituted or unsubstituted aryl group having from about 6 to about 20 carbon atoms;

Z is an organic group having from 1 to about 20 carbon atoms or aryl group having from about 6 to about 20 carbon atoms, with at least one of said Z's having at least one primary, secondary, tertiary or quaternary nitrogen atom;

a is an integer from 1 to 3; and

b is an integer from 1 to 3;

with the proviso that  $a + b = 4$ .

13. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises an aluminosilicate polymer.

14. The cationic particle of Claim 1 wherein said outer layer of positive charge comprises an aluminosilicate polymer having the formula:



where the ratio of x:y is between 1 and 3, and a and b are selected such that the rule of charge neutrality is obeyed; and n is between 0 and 10.

15. The cationic particle of Claim 13 wherein said aluminosilicate polymer has a median particle size of between 2 and 20 nm.

16. The cationic particle of Claim 10 wherein said metal oxide hydroxide complex has a median diameter of between 2 and 20 nm.

17. The cationic particle of Claim 10 wherein said core has a zeta potential greater than +20 mV at a pH between 2 and 6.

18. The cationic particle of Claim 1 wherein said cationic shelled particle has a zeta potential greater than +20 mV at a pH between 2 and 6.

19. The cationic particle of Claim 1 wherein said cationic shelled particle has a zeta potential of between +30 and +40 mV at a pH of between 2 and 6.

20. An inkjet recording element comprising a support having thereon an image receiving layer, said inkjet recording element containing cationic shelled particles comprising a core having a median diameter of between 20 and 500 nm and a positive charge, a layer on the surface of said core particles having a negative charge and comprising particles of a median diameter of less than 20% of the median diameter of said core particle, and an outer layer of positive charge.

21. The inkjet recording element of Claim 20 wherein said image-receiving layer comprises said cationic shelled particles.

22. The inkjet recording element of Claim 20 wherein an overcoat layer comprises said cationic shelled particles.

23. The inkjet recording element of Claim 20 wherein said core comprises alumina.

24. The inkjet recording element of Claim 20 wherein said core comprises hydrous alumina.

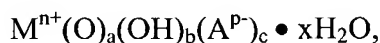
25. The inkjet recording element of Claim 20 wherein said core has a median diameter of between 50 and 500 nm.

26. The inkjet recording element of Claim 20 wherein said layer on the surface of said core comprises particles of silica.

27. The inkjet recording element of Claim 20 wherein said layer on the surface of said core comprises particles having a median diameter of between 2 and 20 nm.

28. The inkjet recording element of Claim 20 wherein said layer on the surface of said core comprises between 0.1% and 20% of the median diameter of said core.

29. The inkjet recording element of Claim 20 wherein said outer layer of positive charge comprises a metal oxide hydroxide complex



wherein

M is at least one metal ion;

n is 3 or 4;

A is an organic or inorganic ion;

p is 1, 2 or 3; and

x is equal to or greater than 0;

with the proviso that when n is 3, then a, b and c each comprise a rational number as follows:  $0 \leq a < 1.5$ ;  $0 < b < 3$ ; and  $0 \leq pc < 3$ , so that the charge of the  $M^{3+}$  metal ion is balanced;

and when n is 4, then a, b and c each comprise a rational number as follows:  $0 \leq a < 2$ ;  $0 < b < 4$ ; and  $0 \leq pc < 4$ , so that the charge of the  $M^{4+}$  metal ion is balanced.

30. The inkjet recording element of Claim 20 wherein said outer layer of positive charge comprises a organosilane or hydrolyzed organosilane having the formula:



wherein

R is hydrogen, or a substituted or unsubstituted alkyl group having from 1 to about 20 carbon atoms or a substituted or unsubstituted aryl group having from about 6 to about 20 carbon atoms;

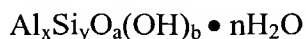
Z is an organic group having from 1 to about 20 carbon atoms or aryl group having from about 6 to about 20 carbon atoms, with at least one of said Z's having at least one primary, secondary, tertiary or quaternary nitrogen atom;

a is an integer from 1 to 3; and

b is an integer from 1 to 3;

with the proviso that  $a + b = 4$ .

31. The inkjet recording element of Claim 20 wherein said outer layer of positive charge comprises an aluminosilicate polymer having the formula:



where the ratio of x:y is between 1 and 3, and a and b are selected such that the rule of charge neutrality is obeyed; and n is between 0 and 10.

32. The inkjet recording element of Claim 20 wherein said aluminosilicate polymer has a median particle size of between 2 and 20 nm.

33. The inkjet recording element of Claim 20 wherein said outer layer comprises metal oxide hydroxide complex particles having a median diameter of between 2 and 20 nm.

34. The inkjet recording element of Claim 20 wherein said cationic shelled particle has a zeta potential of between +30 and +40 mV at a pH of between 2 and 6.